UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/386,270	08/31/1999	JAMES B. LOVELAND	7927.90	1223

21999 7590 08/15/2003

KIRTON AND MCCONKIE
1800 EAGLE GATE TOWER
60 EAST SOUTH TEMPLE
P O BOX 45120
SALT LAKE CITY, UT 84145-0120

EXAMINER
SHARON, AYAL I

ART UNIT	PAPER NUMBER
2123	12

DATE MAILED: 08/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No. 09/386,270	Applicant(s) LOVELAND, JAMES B.	
	Examiner Ayal I Sharon	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claims 1-23 of U.S. Application 09/386,270 filed as an RCE on 05/27/03 are presented for examination. Claim 23 is new, and independent Claims 1, 6, 10, 15, and 21 have been amended. The application was originally filed on 08/31/1999, and amended on 1/17/03 (paper #7). The Application is a Continuation of Application 08/991,148 with a filing priority date of 12/16/1997.

Claim Interpretations

2. Examiner interprets "morphing" (See specification: p.13, lines 8-12) as being equivalent to "changing" and "altering".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The prior art used for these rejections is as follows:

5. Maxley, R. and E. Olson, New Riders' Reference Guide to AutoCAD Release 13. 1995. pp.21-39, 63-66, 267, 284-285, 293-295, 304-305, 307-310, 377-380, 402-404, 490-492, 560-562, 642-644. (Henceforth referred to as "**Maxley**").

6. Gromat, J., U.S. Patent 5,950,374. (Henceforth referred to as "**Gromat**").

7. **Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maxley in view of Gromat.**

8. In regards to Claim 1, Maxley teaches the following limitations:

> 1. (currently amended) A method for modeling at least one chamber of a building structure and for enabling estimation of various projects to be completed within said building structure, said method comprising the steps of:
> (Maxley, especially: pp.284-285, Figs. D.80 and D.81)
>
> (a) selecting, from an estimation program, a non-derivational default volumetric polyhedron as an estimation polyhedron, said estimation polyhedron comprising a plurality of facets
> (Maxley, especially: pp.402-404 "Massprop" command)
>
> (b) assigning each of said facets at least one pre-defined estimation attribute that corresponds to a structural attribute of said chamber
> (Maxley, especially: pp.63-66 "Area" command)
>
> (c) morphing a selected facet of said plurality of facets to obtain a morphed facet such that said estimation polyhedron more closely approximates said chamber undergoing estimation;
> (Maxley, especially: pp.307-310 "Extend" command, pp.377-380 "Lengthen" command, pp.642-644 "Stretch" command)
>
> (d) revising said at least one estimation attribute of said morphed facet and any adjacent facets of said estimation polyhedron also modified and affected by said step of morphing, in order to maintain a closed volume of said estimation polyhedron;
> (Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)
>
> (e) repeating said step of morphing and said step of revising until said estimation polyhedron accurately depicts said chamber undergoing estimation; and
> (Maxley, especially: pp.307-310 "Extend" command, pp.63-66 "Area" command. Also, "accurate description" is the intended use of a CAD program)

However, Maxley does not expressly teach the following limitation:

> (f) generating a project estimate by selecting at least one facet of said estimation polyhedron and entering an estimation request into a query in said estimation program, said project estimate is

based upon and associated with said estimation attributes of said estimation polyhedron and corresponds to a project to be completed in said building structure.

Gromat, on the other hand, does expressly teach limitation (f) of Claim 1. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

9. In regards to Claim 2, Maxley teaches the following limitations:

2. The method as recited in claim 1, wherein:

(a) said morphing step further comprises the step of when additional facets better approximate said chamber undergoing approximation, partitioning said selected facet of said estimation polyhedron into at least a first and second morphed facets to provide an improved estimation of said chamber undergoing estimation; and
(Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

(b) said revising step further comprises the step of from said at least first and second morphed facets of said selected facet, including additional estimation attributes corresponding to said first and second morphed facets.
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

10. In regards to Claim 3, Maxley teaches the following limitations:

3. The method as recited in claim 1, further comprising the step of:

(a) defining said chamber as a room within a building; and
(Maxley, especially: pp.284-285, Figs. D.80 and D.81)

(b) defining said attributes to include a surface area correlating to said plurality of facets of said estimation polyhedron.
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

11. In regards to Claim 4, Maxley teaches the following limitations:

4. The method as recited in claim 3, wherein said defining said chamber attribute step further comprises the steps of:

(a) assigning one of said plurality of facets of said estimation polyhedron a floor attribute of said room;
(Maxley, especially: pp.63-66 "Area" command)

(b) assigning each of others of said plurality of facets of said estimation polyhedron adjacent to said facet having said floor attribute a wall attribute;
(Maxley, especially: pp.63-66 "Area" command)

(c) assigning one of said plurality of facets of said estimation polyhedron adjacent to said ones of said plurality of facets having said wall attribute a ceiling attribute.
(Maxley, especially: pp.63-66 "Area" command)

12. In regards to Claim 5, Maxley teaches the following limitations:

5. The method as recited in claim 1, wherein said selecting a default polyhedron further comprises the step of:

(a) defining said default polyhedron to include:
i. at least 4 facets each defined by a plurality of vertices shared by others of said at least 4 facets;
ii. a surface area for each of said at least 4 facets; and
iii. a volume of said default polyhedron as bounded by each of said at least 4 facets.
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

13. In regards to Claim 6, Maxley teaches the following limitations:

6. (currently amended) A method for graphically estimating attributes of a room of a building structure, said method comprising the steps of:
(Maxley, especially: pp.284-285, Figs. D.80 and D.81)

(a) selecting a default volumetric polyhedron as an estimation polyhedron to approximate said attributes of said room, said estimation polyhedron comprising a plurality of facets;
(Maxley, especially: pp.402-404 "Massprop" command)

(b) assigning each of said facets at least one pre-defined estimation attribute that corresponds to a structural attribute of said room;
(Maxley, especially: pp.63-66 "Area" command)

(c) morphing at least one of said plurality of facets of said estimation polyhedron to obtain a morphed facet and to more closely approximate said room undergoing estimation;
(Maxley, especially: pp.307-310 "Extend" command, pp.377-380 "Lengthen" command, pp.642-644 "Stretch" command)

(d) revising said at least one estimation attribute of said morphed facet and any adjacent facets of said estimation polyhedron also modified and affected by said step of morphing, in order to maintain a closed volume of said estimation polyhedron;
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

(e) repeating said morphing and revising steps until said estimation polyhedron accurately depicts said room undergoing estimation;
(Maxley, especially: pp.307-310 "Extend" command, pp.63-66 "Area" command. Also, "accurate description" is the intended use of a CAD program)

(f) listing said estimation attributes of said estimation polyhedron as said attributes of said room; and
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

However, Maxley does not expressly teach the following limitation:

(g) generating a project estimate by selecting an estimation attribute from said list and entering an estimate request into a query in said estimation program, said project estimate is based upon and associated with said selected estimation attribute and corresponds to a project to be completed in said building structure.

Gromat, on the other hand, does expressly teach limitation (g) of Claim 1. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to

> automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

14. In regards to Claim 7, Maxley teaches the following limitations:

> 7. The method as recited in claim 6, wherein said selecting step further comprises the steps of:
>
> (a) assigning one of said plurality of facets of said estimation polyhedron a floor attribute of said room;
> (Maxley, especially: pp.63-66 "Area" command)
>
> (b) assigning each of others of said plurality of facets of said estimation polyhedron adjacent to said facet having said floor attribute a wall attribute; and
> (Maxley, especially: pp.63-66 "Area" command)
>
> (c) assigning one of said plurality of facets of said estimation polyhedron adjacent to said ones of said plurality of facets having said wall attribute a ceiling attribute.
> (Maxley, especially: pp.63-66 "Area" command)

15. In regards to Claim 8, Maxley teaches the following limitations:

> 8. The method as recited in claim 6, wherein:
>
> (a) said morphing step further comprises the step of when additional facets better approximate said chamber undergoing approximation, partitioning said selected facet of said estimation polyhedron into at least a first and second morphed facets to provide an improved estimation of said chamber undergoing estimation; and
> (Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

(b) said revising step further comprises the step of from said at least first and second morphed facets of said selected facet, including additional stimation attributes corresponding to said first and second morphed facets.
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

16. In regards to Claim 9, Maxley teaches the following limitations:

9. The method as recited in claim 6, further comprising the steps of hierarchically grouping additional rooms into levels and grouping a plurality of levels into a structure.
(Maxley, especially: pp.34-37 "3Darray" command; p.39 "3Dmesh" command;)

17. In regards to Claim 10, Schmitt teaches the following limitations:

10. (currently amended) A graphical method for estimating material requirements for a room within a structure, wherein said room is comprised of a plurality of planes, comprising:
(Maxley, especially: pp.284-285, Figs. D.80 and D.81)

(a) displaying a default surface polygon, said surface polygon forming one plane of a plurality of planes of a volumetric estimation polyhedron for approximating said room, said plurality of planes each further having an estimation attribute assigned thereto that corresponds to a structural attribute of said room;
(Maxley, especially: pp.284-285, Figs. D.80 and D.81, pp.63-66 "Area" command, pp.402-404 "Massprop" command)

(b) morphing said default surface polygon into a morphed polygon to approximate a plane of said room undergoing estimation;
(Maxley, especially: pp.307-310 "Extend" command, pp.377-380 "Lengthen" command, pp.642-644 "Stretch" command)

(c) revising said estimation attribute of said morphed polygon and adjacent ones of said plurality of planes affected by said morphing step in order to maintain a closed volume of said estimation polyhedron;
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

(d) repeating said morphing and revising steps until said estimation polyhedron accurately approximates said room undergoing estimation;
(Maxley, especially: pp.307-310 "Extend" command, pp.63-66 "Area" command. Also, "accurate approximation" is the intended use of a CAD program)

However, Maxley does not expressly teach the following limitation:

(e) converting said estimation attributes of said estimation polyhedron into said material requirements for said room within said structure by selecting at least one plane of said estimation polyhedron and entering a materials request into a query in said estimation program.

Gromat, on the other hand, does expressly teach limitation (e) of Claim 1. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

> Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

18. In regards to Claim 11, Maxley teaches the following limitations:

> 11. The method as recited in claim 10, wherein:
>
> (a) said morphing step further comprises the step of when additional planes better approximate said room undergoing estimation, partitioning said morphed polygon of said estimation polyhedron into at least a first and second morphed polygons to provide an improved estimation of said room undergoing estimation; and

(Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

> (b) said revising step further comprises the step of from said at least first and second morphed polygons of said selected facet, including additional estimation attributes corresponding to said first and second morphed polygons.

(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

19. In regards to Claim 12, Maxley does not expressly teach the following limitation:

> 12. The method as recited in claim 11, wherein said converting said estimation

attributes of said estimation polyhedron step comprises the step of:

(a) converting said estimation attribute into a quantity of a specific one of said material requirements.

Gromat, on the other hand, does expressly teach limitation (a) of Claim 12. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

> Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

20. In regards to Claim 13, Maxley teaches the following limitations:

13. The method as recited in claim 11, further comprising the steps of:

(a) redefining another one of said plurality of planes of said estimation polyhedron as said default surface polygon to display, morph and revise estimation attributes associated therewith.

(Maxley, especially: pp.63-66 "Area" command)

21. In regards to Claim 14, Maxley teaches the following limitations:

14. The method as recited in claim 10, wherein said displaying step further comprises the steps of:

(a) assigning one of said plurality of planes of said estimation polyhedron a floor attribute of said room;

(Maxley, especially: pp.63-66 "Area" command)

(b) assigning each of others of said plurality of planes of said estimation polyhedron adjacent to said plane having said floor attribute a wall attribute; and
(Maxley, especially: pp.63-66 "Area" command)

(c) assigning one of said plurality of planes of said estimation polyhedron adjacent to said ones of said plurality of planes having said wall attribute a ceiling attribute.
(Maxley, especially: pp.63-66 "Area" command)

22. In regards to Claim 15, Schmitt teaches the following limitations:

15. (currently amended) A computer-readable medium having computer-executable instructions for performing the steps comprising:

(a) displaying a default surface polygon, said surface polygon forming one plane of a plurality of planes of a volumetric estimation polyhedron for approximating room of a building structure
(Maxley, especially: pp.284-285, Figs. D.80 and D.81,)

(b) assigning each of said planes at least one pre-defined estimation attribute that corresponds to a structural attribute of said room;
(Maxley, especially: pp.63-66 "Area" command, pp.402-404 "Massprop" command)

(c) morphing said default surface polygon into a morphed polygon such that said morphed polyhedron more closely approximates a plane of said room undergoing estimation;
(Maxley, especially: pp.307-310 "Extend" command, pp.377-380 "Lengthen" command, pp.642-644 "Stretch" command)

(d) revising said estimation attribute of said morphed polygon and any adjacent planes modified and affected by said morphing step, in order to maintain a closed volume of said estimation polyhedron;
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

(e) repeating said morphing and revising steps until said estimation polyhedron accurately approximates said room of said building structure undergoing estimation; and
(Maxley, especially: pp.307-310 "Extend" command, pp.63-66 "Area" command. Also, "accurate approximation" is the intended use of a CAD program)

However, Maxley does not expressly teach the following limitation:

(f) generating a project estimate by selecting at least one plane of said estimation polyhedron and entering an estimation request into a query in said estimation program, said project estimate is based upon and associated with said estimation attributes of said estimation polyhedron and corresponds to a project to be completed in said building structure.

Gromat, on the other hand, does expressly teach limitation (f) of Claim 1. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

> Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

23. In regards to Claim 16, Maxley teaches the following limitations:

> 16. The computer-readable medium of claim 15 having further Computer executable instructions for performing the steps of:
>
> (a) said morphing step further comprises the step of when additional planes better approximate said room undergoing estimation, partitioning said morphed polygon of said estimation polyhedron into at least a first and second morphed polygons to provide an improved estimation of said room undergoing estimation; and
> (Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)
>
> (b) said revising step further comprises the step of from said at least first and second morphed polygons of said selected facet, including additional estimation attributes corresponding to said first and second morphed polygons.
> (Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

24. In regards to Claim 17, Maxley does not teach the following limitations:

> 17. The computer-readable medium of claim 15, wherein said computer executable instructions for performing the step of converting said estimation attributes of said estimation polyhedron step further comprises computer-executable instructions for performing the step of:
>
> (a) converting said estimation attribute into a quantity of a specific one of said material requirements.

Gromat, on the other hand, does expressly teach limitation (a) of Claim 12. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

> Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

25. In regards to Claim 18, Maxley teaches the following limitations:

> 18. The computer-readable medium of claim 15, having further computer executable instructions for performing the steps of:
>
> (a) redefining another one of said plurality of planes of said estimation polyhedron as said default surface polygon to display, morph and revise estimation attributes associated therewith.

(Maxley, especially: pp.63-66 "Area" command)

26. In regards to Claim 19, Maxley teaches the following limitations:

> 19. The computer-readable medium of claim 15, wherein said computer executable instructions for performing the step of displaying a default surface polygon further comprises computer-executable instructions for performing the step of:

(a) assigning one of said plurality of planes of said estimation polyhedron a floor attribute of said room;
(Maxley, especially: pp.63-66 "Area" command)

(b) assigning each of others of said plurality of planes of said estimation polyhedron adjacent to said plane having said floor attribute a wall attribute; and
(Maxley, especially: pp.63-66 "Area" command)

(c) assigning one of said plurality of planes of said estimation polyhedron adjacent to said ones of said plurality of planes having said wall attribute a ceiling attribute.
(Maxley, especially: pp.63-66 "Area" command)

27. In regards to Claim 20, Maxley teaches the following limitations:

20. The computer-readable medium of claim 15, having further computer executable instructions for performing the step of hierarchically grouping additional rooms into levels and grouping a plurality of levels into a structure.
(Maxley, especially: pp.34-37 "3Darray" command; p.39 "3Dmesh" command;)

28. In regards to Claim 21, Maxley teaches the following limitations:

21. (currently amended) A method for computerized modeling of at least one chamber of a building structure and for enabling estimation of various chamber projects, said method comprising the steps of:
(Maxley, especially: pp.284-285, Figs. D.80 and D.81)

(a) selecting, from an estimation program, a default polyhedron as a volumetric estimation polyhedron, said estimation polyhedron comprising a plurality of vertices and facets
(Maxley, especially: pp.402-404 "Massprop" command)

(b) assigning each of said facets at least one pre-determined estimation attribute corresponding to a structural attribute of said chamber;
(Maxley, especially: pp.63-66 "Area" command)

(c) dragging at least one of said plurality of vertices to alter at least one of said characteristics of said facet of said estimation polyhedron to obtain an altered facet that more closely approximates said chamber undergoing estimation;
(Maxley, especially: pp.307-310 "Extend" command, pp.377-380 "Lengthen" command, pp.642-644 "Stretch" command)

(d) recalculating said at least one estimation attribute of said altered facet and any adjacent facets of said estimation polyhedron also modified arid affected by said altering step in order to maintain a closed volume of said estimation polyhedron;

(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

(e) repeating said altering and recalculating steps until said estimation polyhedron accurately depicts said chamber such that said calculated estimation attribute accurately estimates said chamber;
(Maxley, especially: pp.307-310 "Extend" command, pp.63-66 "Area" command. Also, "accurate estimation" is the intended use of a CAD program)

However, Maxley does not expressly teach the following limitation:

(f) generating a project estimate by selecting at least one facet of said estimation polyhedron and entering an estimation request into a query in said estimation program, said project estimate is based upon and associated with said estimation attributes of said estimation polyhedron and corresponds to a project to be completed in said building structure.

Gromat, on the other hand, does expressly teach limitation (f) of Claim 1. Gromat teaches the following (see col.6, line 63 to col.7, line 10):

Preferably the grid layout is generated as a computer image and the layouts are formed on screen for the respective functions, such as room layout, matching roof layout and doors and windows, for example, with or by a customer if desired. Using simple CAD techniques, the computer can be programmed to automatically generate a three dimensional drawing of the structure and can unload details of the respective panel frame sections to suit, to workshop metal working apparatus for cost effective and accurate prefabrication of all structural frame assemblies. Furthermore, substantially instantaneous calculations may be automatically computed of the weight of steel, the number of joining members and cost of supply thereof. A typical organizational marketing manufacturing and supply structure is illustrated in the flow chart of FIG. 18.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Maxley with those of Gromat, because doing so would be "cost effective" and "accurate" (see Gromat, col.6, line 63 to col.7, line 10).

29. In regards to Claim 22, Maxley teaches the following limitations:

22. The method as recited in claim 21, wherein:

said altering step further comprises the step of when additional facets better approximated said chamber undergoing approximation, partitioning said

selected facet of said estimation polyhedron into at least a first and a second altered facet to provide an improved estimation of said chamber undergoing estimation.; and
(Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

said recalculating step further comprising the step of including additional estimation attributes corresponding to said first and second altered facets.
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

30. In regards to Claim 23, Maxley teaches the following limitations:

23. (new) The method of claim 1, further comprising the steps of:

(a) obtaining additional volumetric polyhedrons, each of which are utilized as estimation polyhedrons, said additional volumetric polyhedrons also comprising a plurality of facets; and
(Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

(b) combining said additional volumetric polyhedrons with said default volumetric polyhedron to obtain a plurality of volumetric polyhedrons for modeling hierarchical structures comprised of multiple chambers;
(Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

(c) assigning each of said facets in said plurality of volumetric polyhedrons at least one estimation attribute corresponding to an attribute of one of said chambers in said hierarchal structure;
(Maxley, especially: p.39 "3Dmesh" command; pp.560-562 "Revsurf" command; pp.293-295 "Edgesurf" command; pp.304-305 "Explode" command; pp.490-492 "Pface" command)

(c) morphing at least one selected facet of said plurality of volumetric polyhedrons to more closely approximate said chambers of said hierarchal structure and
(Maxley, especially: pp.307-310 "Extend" command, pp.377-380 "Lengthen" command, pp.642-644 "Stretch" command)

(d) revising said estimation attributes of all relevant facets in response to said step of morphing.
(Maxley, especially: pp.63-66 "Area" command and pp.402-404 "Massprop" command)

Response to Arguments

31. Applicant argued (paper #11, pp.16-24) that Claims 1, 6, 10, 15, and 21 have been amended to reflect or recite subject matter not disclosed or taught in Schmitt.

32. Examiner has found all of these arguments to be persuasive and has withdrawn all 35 USC §102 rejections based on the Schmitt reference.

33. In response to the amendment, new rejections have been applied.

Conclusion

34. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.

35. Wildstrom, S. "3-D Home-Design: Keep It Simple: Two modest software programs work well, but blueprints still may be the best bet." Business Week. April 7, 1997. Page 2 of this reference teaches that Autodesk's Kitchen program generates blueprints, a bill of materials, and a lumber-cutting plan.

36. Yares, E. "AutoCAD R13 looks to the future." Computer-Aided Engineering. April 1995. Page 4 of this reference teaches that "Mass properties, volume and area calculations car [sic] be performed on solid objects".

37. Ross, S. "All in the Family: Two low-end programs with strong ties to high-end AutoCAD also need ties to other software for optimal use." Architectural Record. July 1996. In the section about the product "Pro Builder 3D" (p.3), this reference teaches that "The estimating module is awesome (you can produce a true bill of materials on it), but you must run it with Excel."

38. Ross, S. "A Data Gateway for AutoCAD." Architectural Record. Sept. 1996. Page 2 of this reference teaches object-oriented drawing methods and features in the "ADE".

39. PR Newswire, "Autodesk Ships New Architecture-Specific Design Software". Oct. 19, 1998. This reference is too recent to be used as prior art, but Examiner has deemed it to be relevant because it provides a launch date for Autodesk's AutoCAD Architectural Desktop product.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (703) 306-0297. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on (703) 305-9704. Any response to this office action should be mailed to:

Director of Patents and Trademarks
Washington, DC 20231

Hand-delivered responses should be brought to the following office:

4th floor receptionist's office

Crystal Park 2
2121 Crystal Drive
Arlington, VA

The fax phone numbers for the organization where this application or proceeding is assigned are:

Official communications:	(703) 746-7239
Non-Official / Draft communications	(703) 746-7240
After Final communications	(703) 746-7238

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is: (703) 305-3900.

Ayal I. Sharon

Art Unit 2123

August 6, 2003